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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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EXAMINER	
BEHREND,H	
ART UNIT	**PAPER NUMBER**
3641	20

DATE MAILED: 09/26/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

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DATE MAILED:

This is a communication from the examiner in charge of your application.
COMMISSIONER OF PATENTS AND TRADEMARKS

☐ This application has been examined ☒ Responsive to communication filed on 7/17/01 ☐ This action is made final.

A shortened statutory period for response to this action is set to expire 3 month(s), _____ days from the date of this letter.
Failure to respond within the period for response will cause the application to become abandoned. 35 U.S.C. 133

Part I THE FOLLOWING ATTACHMENT(S) ARE PART OF THIS ACTION:

1. ☒ Notice of References Cited by Examiner, PTO-892.
2. ☐ Notice of Draftsman's Patent Drawing Review, PTO-948.
3. ☒ Notice of Art Cited by Applicant, PTO-1449.
4. ☐ Notice of Informal Patent Application, PTO-152.
5. ☐ Information on How to Effect Drawing Changes, PTO-1474.
6. ☐ _____.

Part II SUMMARY OF ACTION

1. ☒ Claims 59-67 are pending in the application.

   Of the above, claims _____ are withdrawn from consideration.

2. ☐ Claims _____ have been cancelled.

3. ☐ Claims _____ are allowed.

4. ☒ Claims 59-67 are rejected.

5. ☐ Claims _____ are objected to.

6. ☐ Claims _____ are subject to restriction or election requirement.

7. ☐ This application has been filed with informal drawings under 37 C.F.R. 1.85 which are acceptable for examination purposes.

8. ☐ Formal drawings are required in response to this Office action.

9. ☐ The corrected or substitute drawings have been received on _____. Under 37 C.F.R. 1.84 these drawings are ☐ acceptable; ☐ not acceptable (see explanation or Notice of Draftsman's Patent Drawing Review, PTO-948).

10. ☐ The proposed additional or substitute sheet(s) of drawings, filed on _____, has (have) been ☐ approved by the examiner; ☐ disapproved by the examiner (see explanation).

11. ☐ The proposed drawing correction, filed _____, has been ☐ approved; ☐ disapproved (see explanation).

12. ☐ Acknowledgement is made of the claim for priority under 35 U.S.C. 119. The certified copy has ☐ been received ☐ not been received ☐ been filed in parent application, serial no. _____; filed on _____.

13. ☐ Since this application apppears to be in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under Ex parte Quayle, 1935 C.D. 11; 453 O.G. 213.

14. ☐ Other

EXAMINER'S ACTION

1. Applicant filed a Request for Continued Examination (RCE) on 7/17/01. The 4/6/00 restriction/election of species requirements and applicants 5/1/00 response thereto, is carried forward in this RCE.

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. The specification is objected to under 35 U.S.C. §112, first paragraph, as failing to provide an adequate written description of the invention and as failing to adequately teach how to make and/or use the invention i.e., failing to provide an enabling disclosure, for the reasons set for in the 2/21/01 Office action (in sections 5-9 on pages 3-7 thereof) and in the 7/5/00 Office action (in sections 6 and 9 on pages 3-6 thereof).

It is maintained that there is no adequate description nor enabling disclosure of how nuclear fusion can actually be operatively obtained with the disclosed and claimed invention.

A disclosure in an application, to be complete, must contain such description and details as to enable any person skilled in the art or science to which the invention pertains, to make and use the invention as of its filing date, In re Glass, 181 USPQ 31.

It is not clear from the disclosure that nuclear fusion will be obtained in the system illustrated in the drawings and described in the specification. No specific parameters are given and no specific example is provided.

Specific operative embodiments or examples of the invention must be set forth. Examples and description should be of sufficient scope as to justify the scope of the claims. See MPEP 608.01 (p).

There is no adequate description nor enabling disclosure of how and in what manner, a Bose-Einstein condensate can be formed from atoms inside the reaction chamber (e.g. see the specification on page 4 lines 14+).

There is no adequate description nor enabling disclosure of how and in what manner, a Bose-Einstein condensate could be formed outside the reaction chamber, (such as in preparation chamber 124), and, as to how and in what manner it is caused to remain as a Bose-Einstein condensate while it is being transported/delivered to its ultimate point of use (e.g. the point in the reaction chamber where it is irradiated with the laser beams).

There is no adequate description nor enabling disclosure of how and in what manner, it is ensured that two of the "He will fuse to produce ^{8}Be, that the ^{8}Be will fuse with an ^{4}He to produce ^{12}C (nor as to how it is ensured that there will be an ^{4}He present or adjacent the ^{8}Be such that fusion will occur before the unstable ^{8}Be breaks up).

There is no adequate description nor enabling disclosure of how and in what manner, a Bose-Einstein condensate can be encapsulated in a small plastic sphere and still remain as a

Bose-Einstein condensate until irradiated with the laser beam in the reaction chamber (see the specification on page 4 lines 22+ and page 9 lines 12+).

There is no adequate description nor enabling disclosure of how and in what manner, it is determined that a Bose-Einstein condensate is actually present.

There is no adequate description nor enabling disclosure of how and in what manner it is determined that at least two of the atoms within the Bose-Einstein condensate are "co-located" as set forth in claim 59 and, that at least two atoms have "overlapping wave functions" as recited in claim 62.

In this respect, the 1998 Sid Perkins article (submitted by applicant with the 7/17/01 response) appears to indicate that there are problems/difficulties in determining such.

Said Sid Perkins article also indicates that only a portion of the liquid helium may actually exist as a Bose-Einstein condensate.

In this same regard, it is noted that applicants specification requires all of the target means 102/202/304/404/502 to exist as a Bose-Einstein condensate.

However, there is no adequate description nor enabling disclosure of how and in what manner, it is ensured that all of the target means (e.g. applicants element 102) exists only as a Bose-Einstein condensate.

There is no adequate description nor enabling disclosure of how and in what manner, applicants invention would be operative if only a portion of the target means 102 existed as a Bose-Einstein condensate.

The disclosure is insufficient as to the minimum (as well as to the maximum) number of atoms in the Bose-Einstein condensate (e.g. element 102) necessary for applicants invention to be operative in obtaining nuclear fusion.

Applicants disclosure is also insufficient as to the requisite laser parameters, e.g. frequency, energy, etc., necessary to cause nuclear fusion in the Bose-Einstein condensate.

The John Wheeler article submitted by applicant with the 7/17/01 response indicates that nuclear fusion was obtained when a specified laser with specified parameters irradiated large clusters of deuterium atoms (more than 1000 atoms per cluster) (the ions ejected from one cluster could collide with other ejected ions with sufficient energy to cause nuclear fusion).

Said Wheeler article is thus evidence that nuclear fusion cannot be obtained with just any size target (e.g. number of atoms per target or unit volume) and just any laser but that rather, if is necessary to have a particular size target and very specified laser parameters (none of which are present in the instant case).

The present case is considered analogous to that in In re Chilowsky, 134 USPQ 515 wherein the court held the disclosure to be insufficient. In the present case (despite applicants arguments to the contrary), the examiner has shown that various necessary parameters have not been provided and, the examiner has provided evidence that the artisan does not know the requisite parameters of an operative Bose-Einstein condensate fusion system, nor how to make an operative Bose-Einstein condensate fusion system.

Note in the respect, the Court's statement on page 519 of In re Chilowsky:

"Chilowsky could not start to describe his invention with the assumption that those skilled in the art knew in detail how to build his nuclear reactor. Since it was a major part of what he purported to have invented, it was incumbent on him, under section 112, to tell how to build it, under principles of patent law too elementary to require discussion".

It appears that at most, applicant has not set forth a theoretical concept concerning the obtainment of nuclear fusion in a Bose-Einstein condensate. However, it is well known in the nuclear fusion field that theory and reality have a habit of not coinciding.

That this is so can be seen from applicants own articles submitted with the 7/17/01 response. For example, in the Fusion Technology article, applicant basically sets forth his speculation as to possibly obtaining nuclear fusion in a Bose-Einstein condensate and, suggests that experiments be conducted to test his idea.

Likewise with the Laser Focus World article in which applicant states:

> "I am now looking for organizations that could do the experiment and see if the physical phenomenon actually happens. I have talked with several friends of mine who are research physicists (I am a physicist myself but my line of work is fiber optics), and most say that they can not see a reason why it will not work. But in such a case the only way to be sure is to test the idea and see. The cost of the test is very small compared to the possible benefits." (Underlining added)

Such was indicated by applicant to the examiner in the 7/12/01 interview in which Mr. Laor indicated that while he considered or believed that his invention would work in the manner indicated, actual experiments would be necessary to confirm his beliefs and to determine the actual system parameters necessary to cause nuclear fusion.

There is accordingly, no evidence of record to indicate that applicant has progressed his system beyond the point of an unproven theory or concept which still required an undue amount

of experimentation to enable the artisan to make and use the inventive system for its indicated purposes. This view is also considered supported by the failure to set forth a full example of the specific parameters of an operative embodiment. One cannot rely on the skill in the art for the selection of the proper quantitive values to present an operative system, since those in the art do not know what these values would be. See Bank v. Rauland Corp. 64 USPQ 93; In re Corneil et al, 145 USPQ 697.

It is thus considered that the examiner (or the reasons set forth above) has set forth a reasonable and sufficient basis for challenging the adequacy of the disclosure. The statute requires the application itself to inform, not to direct others to find out for themselves; In re Gardner et al, 166 USPQ 138, In re Scarbrough, 182 USPQ 298. Note that the disclosure must enable a person skilled in the art, to practice the invention without having to design structure not shown to be readily available in the art; In re Hirsch, 131 USPQ 198.

4. Claims 59-67 are rejected under 35 U.S.C. §112, first paragraph, for the reasons set forth in the objection to the specification, in section 3 above.

5. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

6. Claims 59-67 are rejected under 35 U.S.C. 101 because the invention as disclosed is inoperative and therefore lacks utility, for the reasons set forth in the 2/21/01 Office action (see sections 14-19 on pages 8-10 thereof).

Further, the reasons that the invention as disclosed is inoperative are the same as the reasons set forth in section 3 above as to why the specification is objected to and the reasons set forth in said section 3 above are accordingly incorporated herein.

It is maintained that applicant at best, has set forth what may be considered a concept or an object of scientific research. However, it has been held that such does not present a utility within the meaning of 35 U.S.C. 101. See Brenner v. Manson, 148 USPQ 689.

Additionally, it is well established that where as here, the utility of the claimed invention is based upon allegations that border on the incredible or allegations that would not be readily accepted by a substantial portion of the scientific community, sufficient substantiating evidence of operability must be submitted by applicant. Note In re Houghton, 167 USPQ 687 (CCPA 1970); In re Ferens, 163 USPQ 609 (CCPA 1969); Puharich v. Brenner, 162 USPQ 136 (CADC 1969); In re Pottier, 152 USPQ 407 (CCPA 1967); In re Ruskin, 148 USPQ 221 (CCPA 1966); In re Citron, 139 USPQ 516 (CCPA 1963); and In re Novak, 134 USPQ 335 (CCPA 1962).

7. Claims 59-67 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

There is no support in the original disclosure for stating that in the Bose-Einstein condensate, at least two atoms are "co-located" or have "overlapping wave functions". There is also no support in the original disclosure for stating that the first isotope formed (i.e. the ^{8}Be) is

"co-located" or has an "overlapping wave function" with an ^{4}He atom in the Bose-Einstein condensate.

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless --
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

9. Claims 62-67 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by any of Lo (US 4875213, hereinafter, Lo (I)), Lo (WO 93/11543, hereinafter, Lo (II)), Lo (WO87/00681, hereinafter, Lo (III)), Lo(IV) (US 4926436) or Lo (V)(WO90/13130).

The references each illustrate the obtainment of nuclear fusion of helium by forming a Bose-Einstein condensate of ^{4}He atoms which is compressed with a laser beam.

Note for example that Lo (II) on page 21 indicates that coherent particles have the same wave function (thus, their wave functions clearly overlap).

Lo(I) at the bottom of col. 1 indicated that a system of coherent particles is called a Bose-Einstein condensate.

Lo(V) on page 15 indicated that coherent alphas will fuse to produce ^{8}Be.

As indicated by the above examples, it is considered that the references each disclose the same structure or system and manner of operation as is recited in the claims. Accordingly, this system and manner of operation of any of the references must also inherently function in the same manner to produce the same results.

As to limitations which are considered to be inherent in a reference, note the case law of In re Ludtke, 169 USPQ 563, In re Swinehart, 169 USPQ 226, In re Fitzgerald, 205 USPQ 594, In re Best, 195 USPQ 430, and In re Brown, 173 USPQ 685, 688.

10. Claims 59-67 are rejected under 35 U.S.C. 103(a) as being unpatentable over any of Lo (US 4875213, hereinafter, Lo (I)), Lo (WO93/11543, hereinafter, Lo (II)), Lo (WO87/00681, hereinafter, Lo (III)), Lo (IV) (US 4926436) or Lo (V) (WO90/13130) in view of any of Corkum, Schaffer, Olson, Laser Focus World or Optical Materials & Engineering News.

Note the discussion of the primary references in section 9 above.

The primary references as indicated above, show laser irradiation of Bose-Einstein condensate to effect nuclear fusion.

The secondary references each show that in the use of lasers in effecting nuclear fusion it is advantageous to utilize femtosecond lasers.

Accordingly, it would have been prima facie obvious to have modified any of the primary references by utilizing as the laser therein, a femtosecond laser because such lasers have been shown to be advantageous as evidenced for example by the teachings thereof in any of the secondary references.

11. Any inquiry concerning this communication should be directed to Mr. Behrend at telephone number (703) 305-1831.

for Behrend/cw
September 18, 2001